WE CLAIM:

1. An artificially produced peptide which neutralizes a biological activity of interleukin-18, comprising a part or the whole of the amino acid sequences of variable regions in anti-interleukin-18 antibody.

2. The peptide of claim 1, wherein the anti-interleukin-18 antibody is a monoclonal antibody.

3. The peptide of claim 1, wherein the anti-interleukin-18 antibody is against human or mouse interleukin-18 as antigen.

4. The peptide of claim 1, which suppresses inflammation induced by the biological activity of interleukin-18.

5. The peptide of claim 1, wherein the variable regions comprise the amino acid sequences of SEQ ID NOs:1 and 2.

6. The peptide of claim 1, which comprises a part or the whole of the amino acid sequences of complementarity determining regions in the variable regions.

7. The peptide of claim 1, which comprises a part or the whole of the amino acid sequences of SEQ ID NOs:3 to 8.

8. The peptide of claim 1, which has an amino acid sequence selected from the group consisting of SEQ ID NOs:9 and 10.

9. The peptide of claim 1, which is in the form of a humanized antibody.

10. A DNA which codes for the peptide of claim 1.

11. The DNA of claim 10, which comprises a part or the whole of a nucleotide sequence selected from the group consisting

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12 ~~10~~. The peptide of claim 1, wherein the interleukin-18-neutralizing activity of said peptide per antigen-binding site is substantially equivalent to that of the parental antibody.

13 ~~11~~. A composition comprising as an effective ingredient the peptide of claim 12 ~~10~~ and a pharmaceutically acceptable carrier.

14 ~~12~~. A method to treat a living body for preventing, alleviating, or remedying a disease selected from the group consisting of asthma, graft-versus-host disease, rheumatoid arthritis, and sepsis, said method comprising administering an effective amount of the composition of claim 13 ~~11~~ to the living body.

15 ~~13~~. A method to treat a living body in need of autoimmunity, immunosuppressive, or anti-inflammatory treatment, said method comprising administering an effective amount of the composition of claim 13 ~~11~~ to the living body.

16 ~~14~~. The peptide of claim 1, wherein the interleukin-18-neutralizing activity of said peptide per antigen-binding site is not lower than that of an immunoglobulin molecule comprising the amino acid sequences of SEQ ID NOs:1 and 2 as the light and heavy chain variable regions respectively.

17 ~~15~~. A composition comprising as an effective ingredient the peptide of claim 16 ~~14~~ and a pharmaceutically acceptable carrier.

18 ~~16~~. A method to treat a living body for preventing, alleviating, or remedying a disease selected from the group consisting of asthma, graft-versus-host disease, rheumatoid arthritis, and sepsis, said method comprising administering an effective amount of the composition of claim 17 ~~15~~ to the living body.

19 ~~17~~. A method to treat a living body in need of autoimmunity, immunosuppressive, or anti-inflammatory treatment, said method comprising administering an effective amount of the composition of claim 17 ~~15~~ to the living body.

20 ~~18~~. The peptide of claim 1, which comprises, as parts of the variable regions in an anti-interleukin-18 antibody, the complementarity determining regions in the light and heavy chain variable regions, wherein not more than 30% of the amino acids of each complementarity determining region are optionally replaced by different amino acids.

21 ~~19~~. The peptide of claim 1, wherein said variable regions are of the same antibody molecule.

22 ~~20~~. The peptide of claim 1, wherein each of the amino acid sequences comprising a part or the whole of the variable regions in an anti-interleukin-18 antibody exhibits the interleukin-18-neutralizing activity when linked with the amino acid sequence of SEQ ID NO:1 or 2 via a suitable linker in a single chain polypeptide.

23 ~~21~~. The peptide of claim 1, which comprises as a light chain variable region the amino acid sequence of SEQ ID

NO:1 or a fragment thereof and as a heavy chain variable region the amino acid sequence of SEQ ID NO.2 or a fragment thereof, wherein each of said fragments exhibits the interleukin-18-neutralizing activity when linked with the amino acid sequence of SEQ ID NO:1 or 2 via a suitable linker in a single chain polypeptide.

24 ~~22~~. A DNA which codes for the peptide of claim 1.

25 ~~23~~. The DNA of claim 24 ~~22~~, which comprises a part or the whole of a nucleotide sequence selected from the group consisting of SEQ ID NOs:11 and 12 and their complementary sequences.

26 ~~24~~. The DNA of claim 24 ~~22~~, which comprises a part or the whole of a nucleotide sequence selected from the group consisting of SEQ ID NOs:13 to 18 and their complementary sequences.

27 ~~25~~. The DNA of claim 24 ~~22~~, which has a nucleotide sequence selected from the group consisting of SEQ ID NOs:19 and 20 and their complementary sequences.

28 ~~26~~. The DNA of claim 24 ~~22~~, wherein at least one nucleotide is replaced by different nuecleotide, on the basis of genetic degeneracy, without changing the amino acid sequence encoded thereby.

29 ~~27~~. The DNA of claim 24 ~~22~~, which is inserted into an autonomously replicable vector.

30 ~~28~~. The DNA of claims 24 ~~22~~, which is introduced into a host selected from the group consisting of animal, plant, and microbial hosts.

31 ~~29~~. A process of producing a peptide comprising allowing a DNA that codes for the peptide of claim 1 to express and collecting the expressed peptide.

32 ~~30~~. The process of claim 31 ~~29~~, wherein the peptide is collected by one or more techniques selected from the group consisting of salting out, dialysis, filtration, concentration, separatory sedimentation, ion-exchange chromatography, gel filtration chromatography, absorption chromatography, isoelectric-focusing chromatography, hydrophobic chromatography, reversed phase chromatography, affinity chromatography, gel electrophoresis, and isoelectric-focusing electrophoresis.

33 ~~31~~. A process of preparing a peptide according to claim 1, comprising:

(a) preparing cells that produce antibodies against IL-18 consisting of the amino acid sequence of SEQ ID NO:21 or 22;

(b) cloning cDNAs for light and heavy chain variable regions from the antibody-producing cells prepared in step (a);

(c) constructing DNAs coding for single chain variable region fragments (scFvs) comprising a part or the whole of each cDNA cloned in step (b);

(d) expressing scFvs from the DNAs constructed in step (c);

(e) testing the scFvs expressed in step (d) on IL-18-neutralizing activity per antigen-binding site in comparison with an immunoglobulin molecule comprising the amino acid sequences of SEQ ID NOs:1 and 2 as the light and heavy chain variable regions respectively;

(f) selecting a DNA expressing an scFv that exhibits IL-18-neutralizing activity per antigen-binding site at a level not lower than that of the immunoglobulin molecule in step (e);

(g) constructing a DNA coding for scFv or humanized antibody as a peptide according to claim 1 with the DNA selected in step (f) and optionally with a foreign DNA, and inserting said constructed DNA into a vector;

(h) expressing the scFv or humanized antibody from the vector prepared in step (g); and

(i) collecting the scFv or humanized antibody from the resulting mixture of step (h).

34 ~~32~~. A process of preparing a pharmaceutical composition for a disease selected from the group consisting of asthma, graft-verus host disease, rheumatoid arthritis, and sepsis, said process comprising:

(a) mixing a physiologically acceptable carrier with the peptide of claim 1 as an effective ingredient; and

(b) formulating the resulting mixture into a formula suitable for medicating a living body.

35 ~~33~~. An agent for susceptive diseases, which comprises the peptide of claim 1 as an effective ingredient.

36 ~~34~~. An agent of claim 35 ~~33~~, which further comprises a pharmaceutically acceptable carrier.

37 ~~35~~. A method to treat a living body for preventing, alleviating, or remedying a disease selected from the group consisting of asthma, graft-versus-host disease, rheumatoid arthritis, and sepsis, said method comprising administering an effective amount of the agent of claim 36 ~~34~~ to the living body.

38 ~~36~~. A method to treat a living body in need of autoimmunity, immunosuppressive, or anti-inflammatory treatment; said method comprising administering an effective amount of the agent of claim 36 ~~34~~ to the living body.

39 ~~37~~. The agent of claim 35 ~~33~~, which contains as a stabilizer one or more members selected from the group consisting of albumin, saccharides, and buffers.

40 ~~38~~. The agent of claim 35 ~~33~~, which is as an agent for auto-immune diseases.

41 ~~39~~. The agent of claim 35 ~~33~~, which is an immunosuppressant.

42 ~~40~~. The agent of claim 35 ~~33~~, which is an anti-inflammation agent.

43 ~~41~~. An interleukin-18 neutralizer, which comprises the peptide of claim 1 as an effective ingredient.

44 ~~42~~. A method of neutralizing interleukin-18, which comprises allowing the peptide of claim 1 to act on interleukin-18.

45 ~~43~~. An interleukin-18 inhibitor, which comprises the peptide of claim 1 as an effective ingredient.

46 ~~44~~. A method of inhibiting interleukin-18, which comprises allowing the peptide of claim 1 to act on interleukin-18.

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